

**EXPRESS TERMS
FOR
PROPOSED BUILDING STANDARDS
REGARDING ADOPTION OF AMENDMENTS TO THE 2007 CALIFORNIA BUILDING STANDARDS CODE,
TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR), PARTS 2, 3, 4, 5 AND 6 INTO
TITLE 24, CCR, PART 11, CALIFORNIA GREEN BUILDING STANDARDS CODE
(HCD 03/07)**

- The Department of Housing and Community Development (HCD) proposes to adopt the 2007 edition of the California Green Building Standards Code (CGBC) as presented on the following pages.

LEGEND FOR EXPRESS TERMS:

1. **New California text:** All language shown underlined.
 2. **Notation:** Authority and Reference citations are provided at the end of each chapter.
-

Adopt new text as follows:

PREFACE

This document is Part 11 of the official compilation and publication of the adoptions, amendments and repeal of regulations to California Code of Regulations, Title 24, also referred to as the California Building Standards Code. This Part is known as the California Green Building Standards Code.

The California Legislature delegated authority to various State agencies, boards, commissions and departments to create building regulations to implement the state's statutes. These building regulations have the same force of law and take effect 180 days after their publication unless otherwise stipulated. The California Building Standards Code applies to all occupancies in the State of California as annotated.

A city, county or city and county may make necessary changes to the provisions contained in this code which are reasonably necessary because of local climatic, geological, or topographical conditions. Findings of the local condition(s) and the adopted local building standard(s) must be filed with the California Building Standards Commission to become effective and may not be effective sooner than the effective date of this edition of the California Building Standards Code. Local building standards that were adopted and applicable to previous editions of the California Building Standards Code do not apply to this edition without appropriate adoption and the required filing.

EFFECTIVE USE OF THIS CODE

This format of this code is common to other parts of the California Building Standards Code and contains building standards applicable to occupancies which fall under the authority of different state agencies. Occupancies and applications under the authority of a specific state agency are identified in Chapter 1, Sections 103 through 106. Sections of this code which are applicable and adopted by each state agency are identified in the Application Checklist for each state agency contained in Chapter 11. The following outline may be helpful as a guide to establish which provisions are applicable to a specific occupancy.

1. Establish the type of occupancy.
2. Verify which state agency has authority for the established occupancy by reviewing the authorities list in Sections 103 through 106.
3. Once the appropriate agency has been identified, find the application checklist for that agency in Chapter 11.
4. The application checklist will list the green building measures adopted, provide the effective date and other information regarding each green building measure applicable to the established occupancy.
5. Each green building measure listed in the application checklist has a section number which correlates with a section number in Chapters 4 through 8.
6. More information is available for each green building measure listed in the application checklist in the correlated sections contained in Chapters 4 through 8.

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CHAPTER 1

ADMINISTRATION

SECTION 101 GENERAL

101.1 Title. These regulations shall be known as the California Green Building Standards Code and may be cited as such and will be referred to herein as “this code.” The California Green Building Standards Code is Part 11 of twelve parts of the official compilation and publication of the adoption, amendment and repeal of building regulations to the California Code of Regulations, Title 24, also referred to as the California Building Standards Code.

101.2 Purpose. The purpose of this code is to improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories:

1. Planning and design.
2. Energy efficiency.
3. Water efficiency and conservation.
4. Material conservation and resource efficiency.
5. Environmental air quality.

101.3 Scope. The provisions of this code shall apply to the planning, design, operation, construction, replacement, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such building structures throughout the State of California.

101.3.1 State-regulated buildings, structures and applications. Provisions of this code shall apply to the following buildings, structures, and applications regulated by state agencies as referenced in the Matrix Adoption Tables and as specified in Sections 103 through 106, except where modified by local ordinance pursuant to Section 101.7. When adopted by a state agency, the provisions of this code shall be enforced by the appropriate enforcing agency, but only to the extent of authority granted to such agency by the State Legislature.

1. State-owned buildings, including buildings constructed by the Trustees of the California State University, and to the extent permitted by California laws, buildings designed and constructed by the Regents of the University of California and regulated by the Building Standards Commission. See Section 103 for additional scoping provisions.
2. Energy efficiency standards regulated by the California Energy Commission
3. Low-rise residential buildings constructed throughout the State of California, including but not limited to, hotels, motels, lodging houses, apartment houses, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with common toilets or cooking facilities. See Section 104 for additional scoping provisions.
4. Public elementary and secondary schools, and community college buildings regulated by the Division of the State Architect. See Section 105 for additional scope provisions.
5. Qualified historical buildings and structures and their associated sites regulated by the State Historical Building Safety Board within the Division of the State Architect.
6. General acute care hospitals, acute psychiatric hospitals, skilled nursing and/or intermediate care facilities, clinics licensed by the Department of Public Health and correctional treatment centers regulated by the Office of Statewide Health Planning and Development. See Section 116 for additional scoping provisions.
7. Graywater systems regulated by the Department of Water Resources.

101.4 Appendices. Provisions contained in the appendices of this code shall not apply unless specifically adopted by a state agency or adopted by a local enforcing agency in compliance with Health and Safety Code Section 18938 (b) for Building Standards Law, Health and Safety Code Section 17950 for State Housing Law and Health and Safety Code Section 13869.7 for Fire Protection Districts. See Section 101.7 of this code.

101.5 Referenced codes and standards. The codes and standards referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

101.5.1 Building. The provisions of the California Building Code shall apply to the construction, alteration, movement, enlargement, replacement, repair, use and occupancy, location, maintenance, removal and demolition of every structure or any appurtenances connected or attached to such buildings or structures.

101.5.2 Electrical. The provisions of the California Electrical Code shall apply to the installation of electrical systems, including but not limited to, alterations, repair, replacement, equipment, appliances, fixtures, fittings and appurtenances thereto.

101.5.3 Mechanical. The provisions of the California Mechanical Code shall apply to the installation, alterations, repair and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

101.5.4 Plumbing. The provisions of the California Plumbing Code shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances where connected to a water or sewage system.

101.5.5 Fire prevention. The provisions of CCR, Title 19, Division 1 and CCR, Title 24, Part 2 and Part 9 relating to fire and panic safety as adopted by the Office of the State Fire Marshal shall apply to all structures, processes and premises for protection from the hazard of fire, panic and explosion.

101.5.6 Energy. The provisions of the California Energy Code shall apply to the minimum design and construction of buildings for energy efficiency.

101.6 Order of precedence and use.

101.6.1 Differences. In the event of any differences between these building standards and the standard reference documents, the text of these building standards shall govern.

101.6.2 Specific provision. Where a specific provision varies from a general provision, the specific provision shall apply.

101.6.3 Conflicts. When the requirements of this code conflict with the requirements of any other part of the California Building Standards Code, Title 24, the most restrictive requirement shall prevail.

101.7 City, county, or city and county amendments, additions or deletions. This code does not limit the authority of city, county, or city and county governments to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1. The effective date of amendments, additions, or deletions to this code of cities, counties, or city and counties filed pursuant to Section 101.8.1 shall be the date on which it is filed. However, in no case shall the amendments, additions or deletions to this code be effective any sooner than the effective date of this code.

Local modifications shall comply with Health and Safety Code Section 18941.5(b) for Building Standards Law, Health and Safety Code Section 17958.5 for State Housing Law or Health and Safety Code Section 13869.7 for Fire Protection Districts.

101.7.1 Findings and filings.

1. The city, county, or city and county shall make express findings for each amendment, addition or deletion based upon climatic, topographical, or geological conditions.
2. The city, county, or city and county shall file the amendments, additions, or deletions expressly marked and identified as to the applicable findings. Cities, counties, cities and counties, and fire departments shall file the amendments, additions or deletions and the findings with the California Building Standards Commission at 2525 Natomas Park Drive, Suite 130, Sacramento, CA 95833.
3. Findings prepared by fire protection districts shall be ratified by the local city, county, or city and county and filed with the California Department of Housing and Community Development at 1800 3rd Street, Room 260, Sacramento, CA 95811.

101.8 Alternate materials, designs and methods of construction. The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. Consideration and compliance provisions for occupancies regulated by adopting state agencies are found in the sections listed below.

1. Section 104.11, Appendix Chapter 1, 2007 California Building Code (CBC) for the California Building Standards Commission and the Division of the State Architect.
2. Section 108.7.2, CBC for the Department of Housing and Community Development.
3. Section 7-104, 2007 California Administrative Code for the Office of the Statewide Health Planning and Development.

101.9 Effective date of this code. Only those standards approved by the California Building Standards Commission that are effective at the time an application for a building permit is submitted shall apply to the plans and specifications for, and to the construction performed under, that permit. For the effective dates of the provisions contained in this code, see the appropriate application checklist in Chapter 11 of this code and the History Note page of this code.

101.10 Mandatory requirements. This code contains both optional and mandatory green building measures. Mandatory and optional measures are identified in the appropriate application checklist contained in Chapter 11 of this code.

101.11 Effective use of this code. The following steps shall be used to establish which provisions of this code are applicable to a specific occupancy:

1. Establish the type of occupancy.
2. Verify which state agency has authority for the established occupancy by reviewing the authorities list Sections 103 through 106.
3. Once the appropriate agency has been identified, find the application checklist for that agency in Chapter 11.
4. The application checklist will list the green building measures adopted, provide the effective date and other information regarding each green building measure applicable to the established occupancy.
5. Each green building measure listed in the application checklist has a section number which correlates with a section number in Chapters 4 through 8.
6. More information is available for each green building measure listed in the application checklist in the correlated sections contained in Chapters 4 through 8.

SECTION 102

CONSTRUCTION DOCUMENTS AND INSTALLATION VERIFICATION

102.1 Submittal documents. Construction documents and other data shall be submitted in one or more sets with each application for a permit. Where special conditions exist, the enforcing agency is authorized to require additional construction documents to be prepared by a licensed design professional.

Exception: The enforcing agency is authorized to waive the submission of construction documents and other data not required to be prepared by a licensed design professional.

102.2 Information on construction documents. Construction documents shall be of sufficient clarity to indicate the location, nature and scope of the proposed green building feature and show that it will conform to the provisions of this code, the California Building Standards Code and other relevant laws, ordinances, rules and regulations as determined by the enforcing agency.

102.3 Verification. Documentation of conformance for applicable green building measures shall be provided to the enforcing agency. Third-party verification or other special documentation shall be provided as specified in this code. Alternate methods of documentation shall be acceptable when the enforcing agency finds that the proposed alternate documentation is satisfactory to demonstrate substantial conformance with the intent of the proposed green building measure.

SECTION 104

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

104.1 Specific scope of application of the agency responsible for enforcement, the enforcement agency, and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

1. Housing construction. Application – Hotels, motels, lodging houses, apartment houses, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities including accessory buildings, facilities and uses thereto. Sections of this code which pertain to applications listed in this section are identified in the Matrix Adoption Table using the abbreviation “HCD 1.”
Enforcing agency—Local building department or the Department of Housing and Community Development.
Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.
Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 2

DEFINITIONS

SECTION 201 **GENERAL**

201.1 Scope. Unless otherwise stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this chapter.

201.2 Interchangeability. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

201.3 Terms defined in other documents. Where terms are not defined in this code and are defined in the California Building Standards Code or other referenced documents, such terms shall have the meanings ascribed to them as in those publications.

201.4 Terms not defined. Where terms are not defined as specified in this section, such terms shall have ordinarily accepted meanings such as the context implies.

SECTION 202 **DEFINITIONS**

AUTOMATIC. Automatic means capable of operating without human intervention.

BUILDING ENVELOPE. The ensemble of exterior and demising partitions of a building that enclose conditioned space.

CALIFORNIA BUILDING CODE. The current version of the California Building Code..

CALIFORNIA ELECTRICAL CODE. The current version of the California Electrical Code.

CALIFORNIA ENERGY CODE. The current version of the California Energy Code.

CALIFORNIA MECHANICAL CODE. The current version of the California Mechanical Code.

CALIFORNIA PLUMBING CODE. The current version of the California Plumbing Code.

CONDITIONED SPACE. A space in a building that is either directly conditioned or indirectly conditioned.

COOLING EQUIPMENT. Equipment used to provide mechanical cooling for a room or rooms in a building.

ENERGY COMMISSION. The California State Energy Resources Conservation and Development Commission.

ENFORCING AGENCY. The designated department or agency as specified by statute or regulation.

GREEN BUILDING. A holistic approach to design, construction, and demolition that minimizes the building's impact on the environment, the occupants, and the community.

INFILTRATION. An uncontrolled inward air leakage from outside a building or unconditioned space, including leakage through cracks and interstices, around windows and doors and through any other exterior or demising partition or pipe or duct penetration.

KITCHEN. That portion in a residential dwelling unit that is a room or area used for cooking, food storage and preparation and washing dishes, including associated counter tops and cabinets, refrigerator, stove, ovens and floor area.

LOW-RISE RESIDENTIAL BUILDING. A building, other than a hotel/motel, that is of Occupancy Group R, Division 1, and is three stories or less, or that is of Occupancy Group R, Division 3.

OUTDOOR AIR (Outside air). Air taken from outdoors and not previously circulated in the building.

RESIDENTIAL BUILDING. (See "low-rise residential building.")

VAPOR BARRIER. Material that has a permeance of one perm or less and that provides resistance to the transmission of water vapor.

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 3

GREEN BUILDING

SECTION 301

GENERAL

301.1 Scope. Buildings shall be designed to include the green building measures specified as mandatory in the application worksheets contained in Chapter 11 of this code. Optional green building measures may be included but are not required.

SECTION 302

MIXED OCCUPANCY BUILDINGS

302.1 Mixed occupancy buildings. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 4

PLANNING AND DESIGN

SECTION 401

GENERAL

401.1 Purpose. The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore, and enhance the environmental quality of the site and respect the integrity of adjacent properties.

SECTION 402

DEFINITIONS

402.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

WATTLES. Wattles are used to reduce sediment in runoff. Wattles are often constructed of natural plant materials such as hay, straw or similar material shaped in the form of tubes and placed on a downflow slope. Wattles are also used for perimeter and inlet controls.

SECTION 403

SITE SELECTION

(Reserved)

SECTION 404

SITE PRESERVATION

(Reserved)

SECTION 405

DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES

(Reserved)

SECTION 406

SITE DEVELOPMENT

406.1 General. Preservation and use of available natural resources shall be accomplished through evaluation and careful planning to minimize negative effects on the site and adjacent areas. Preservation of slopes, management of storm water drainage and erosion controls shall comply with this section.

406.2 Storm water drainage and retention during construction. Projects which disturb less than one acre of soil and are not part of a larger common plan of development which in total disturbs one acre or more, shall develop a plan to manage storm water drainage during construction. A plan to manage storm water drainage during construction shall be implemented to prevent flooding of adjacent property, prevent erosion and retain soil runoff on the site. One or more of the followings methods shall be utilized to manage storm water drainage.

1. Retention basins of sufficient size shall be utilized to retain storm water on the site.
2. Where storm water is conveyed to a public drainage system, collection point, gutter, or similar disposal method, water shall be filtered by use of a barrier system, wattle, or other method approved by the enforcing agency.
3. Compliance with a lawfully enacted storm water management ordinance.

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 5

ENERGY EFFICIENCY

SECTION 501

GENERAL

501.1 Scope. The provisions of this chapter shall outline means of achieving enhanced building energy efficiency.

SECTION 502

DEFINITIONS

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SECTION 503

PERFORMANCE APPROACH

503.2 Minimum energy performance for low-rise residential buildings. Low-rise residential buildings shall meet or exceed the minimum standard design required by the California Energy Code currently in effect.

SECTION 504

PRESCRIPTIVE APPROACH

504.6 Minimum energy performance for low-rise residential buildings. Low-rise residential buildings shall meet or exceed the minimum standard design required by the California Energy Code currently in effect.

SECTION 505

BUILDING ENVELOPE

(Reserved)

SECTION 506

AIR SEALING PACKAGE

506.1 Joints and openings. Openings in the building envelope separating conditioned space from unconditioned space needed to accommodate gas, plumbing, electrical lines and other necessary penetrations must be sealed in compliance with the California Energy Code.

Exception: Annular spaces around pipes, electric cables, conduits, or other openings in plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or similar method acceptable to the enforcing agency.

506.1.1 Other openings. Whole house exhaust fans shall have insulated louvers or covers which close when the fan is off. Covers or louvers shall have a minimum insulation value of R-4.2.

SECTION 507
HVAC DESIGN, EQUIPMENT AND INSTALLATION
(Reserved)

SECTION 508
WATER HEATING DESIGN, EQUIPMENT AND INSTALLATION
(Reserved)

SECTION 509
LIGHTING
(Reserved)

SECTION 510
APPLIANCES
(Reserved)

SECTION 511
RENEWABLE ENERGY
(Reserved)

SECTION 512
ELEVATORS, ESCALATORS AND OTHER EQUIPMENT
(Reserved)

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 6
WATER EFFICIENCY AND CONSERVATION

SECTION 601
GENERAL

601.1 Scope. The provisions of this chapter shall establish the means of conserving water used indoors, outdoors and in wastewater conveyance.

SECTION 602
DEFINITIONS

602.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SECTION 603
INDOOR WATER USE

603.2 20% Savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 20% shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code. The 20% reduction in potable water use shall be demonstrated by one of the following methods.

1. Each plumbing fixture and fitting shall meet the 20% reduced flow rate specified in Table 603.2; or
2. A calculation demonstrating a 20% reduction in the building "water use" baseline as established in Table 603.1 shall be provided. For low-rise residential occupancies, the calculation shall be limited to the following plumbing fixture and fitting types: water closets, urinals, lavatory faucets, showerheads and kitchen faucets.

**TABLE 603.1
WATER USE BASELINE⁵**

Fixture Type	Flow-rate²	Duration	Daily uses	Occupants^{3,4}
Showerheads	2.5 gpm @ 80 psi	5 min.	1	X
Showerheads Residential	2.5 gpm @ 80 psi	8 min.	1	X
Lavatory Faucets Residential	2.2 gpm @ 60 psi	.25 min.	3	X
Kitchen Faucets	2.2 gpm @ 60 psi	4 min.	1	X
Replacement Aerators	2.2 gpm @ 60 psi			X
Wash Fountains	2.2 [rim space(in.) / 20 gpm @ 60 psi]			X
Metering Faucets	0.25 gallons/cycle	.25 min.	3	X
Metering Faucets for Wash Fountains	.25 [rim space(in.) / 20 gpm @ 60 psi]	.25 min.		X
Gravity tank type Water Closets	1.6 gallons/flush	1 flush	1 male ¹ 3 female	X
Flushometer Tank Water Closets	1.6 gallons/flush	1 flush	1 male ¹ 3 female	X
Flushometer Valve Water Closets	1.6 gallons/flush	1 flush	1 male ¹ 3 female	X
Electromechanical Hydraulic Water Closets	1.6 gallons/flush	1 flush	1 male ¹ 3 female	X
Blowout Water Closets	3.5 gallons/flush	1 flush	1 male ¹ 3 female	X
Urinals	1.0 gallons/flush	1 flush	2 male	X

Fixture "Water Use" = Flow rate x Duration x Occupants x Daily uses

- ¹ Except for low-rise residential occupancies the daily use number shall be increased to three if urinals are not installed in the room.
² The Flow-rate is from the CEC Appliance Efficiency Standards, Title 20 California Code of Regulations; where a conflict occurs, the CEC standards shall apply.
³ For low rise residential occupancies, the number of occupants shall be based on two persons for the first bedroom, plus one additional person for each additional bedroom.
⁴ For non-residential occupancies, refer to Table A, Chapter 4, 2007 California Plumbing Code, for occupant load factors.
⁵ Use Worksheet WS-1 to calculate baseline water use.

**TABLE 603.2
FIXTURE FLOW RATES**

Fixture Type	Flow-rate	Maximum flow rate at 20% Reduction
Showerheads	2.5 gpm @ 80 psi	2 gpm @ 80 psi
Lavatory Faucets Residential	2.2 gpm @ 60 psi	1.8 gpm @ 60 psi
Kitchen Faucets	2.2 gpm @ 60 psi	1.8 gpm @ 60 psi
Wash Fountains	2.2 [rim space(in.) / 20 gpm @ 60 psi]	1.8 (rim space(20 in.)) gpm @ 60 psi
Metering Faucets	0.25 gallons/cycle	0.2 gallons/cycle
Metering Faucets for Wash Fountains	.25 [rim space(in.) / 20 gpm @ 60 psi]	1.8 (rim space(20 in.)) gpm @ 60 psi
Gravity tank type Water Closets	1.6 gallons/flush	1.28 gallons/flush
Flushometer Tank Water Closets	1.6 gallons/flush	1.28 gallons/flush
Flushometer Valve Water Closets	1.6 gallons/flush	1.28 gallons/flush
Electromechanical Hydraulic Water Closets	1.6 gallons/flush	1.28 gallons/flush
Blowout Water Closets	3.5 gallons/flush	2.8 gallons/flush
Urinals	1.0 gallons/flush	.8 gallons/flush

SECTION 604
OUTDOOR WATER USE
(Reserved)

SECTION 605
RECYCLED, RECLAIMED AND GRAYWATER SYSTEMS
(Reserved)

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 7
MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 701
GENERAL

701.1 Scope. The provisions of this chapter shall outline means of achieving material conservation and resource efficiency through reuse of existing building stock and materials; use of recycled, regional, rapidly renewable and certified wood materials; and employment of techniques to reduce pollution through recycling of materials and reduction of building pollutants prior to occupancy.

SECTION 702
DEFINITIONS

702.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SECTION 703
FOUNDATION SYSTEMS
(Reserved)

SECTION 704
EFFICIENT FRAMING TECHNIQUES
(Reserved)

SECTION 705
MATERIAL SOURCES
(Reserved)

SECTION 706
ENHANCED DURABILITY AND REDUCED MAINTENANCE
(Reserved)

SECTION 707
WATER RESISTANCE AND MOISTURE MANAGEMENT
(Reserved)

SECTION 708
CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

708.3 Construction waste reduction of at least 50%. Recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction and demolition debris, or meet a local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or volume, but not by both.

Exceptions:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

SECTION 709
LIFE-CYCLE ASSESSMENT
(Reserved)

SECTION 710
BUILDING MAINTENANCE AND OPERATION

710.2 Operation and maintenance manual. At the time of final inspection, a manual which includes all of the following shall be placed in the building:

1. Directions to the owner or occupant that the manual shall remain with the building throughout the life-cycle of the structure.
2. Operation and maintenance instructions for the following.
 - a. Equipment and appliances.
 - b. Roof and yard drainage, including gutters and downspouts.
 - c. Air filters.
 - d. Landscape irrigation systems.
3. Information from local utility, water and waste recovery providers on methods to further reduce resource consumption and recycle.
4. Public transportation and/or carpool options available in the area.
5. Educational material on the positive impacts of an interior relative humidity between 30-60% and what methods an occupant may use to maintain the relative humidity level in that range.
6. Information about water conserving landscape and irrigation design and controllers which conserve water.
7. Instructions for maintaining gutters and downspouts and importance of diverting water at least five feet away from foundation.
8. Information on required routine maintenance measures, including but not limited to, caulking, painting, grading around building, etc.

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 8
ENVIRONMENTAL QUALITY

SECTION 801
GENERAL

801.1 Scope. The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

SECTION 802
DEFINITIONS

802.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AGRIFIBER PRODUCTS. Agrifiber products include wheatboard, strawboard, panel substrates and door cores, not including furniture, fixtures and equipment (FF&E) not considered base building elements.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. Composite wood products do not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber as specified in "Structural Glue Laminated Timber" (ANSI A190.1-2002) or prefabricated wood I-joists.

MERV. Filter minimum efficiency reporting value.

MOISTURE CONTENT. The weight of the water in wood expressed in percentage of the weight of the oven-dry wood.

**SECTION 803
FIREPLACES
(Reserved)**

**SECTION 804
POLLUTANT CONTROL**

804.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation and until final startup of the heating and cooling equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust or debris which may collect in the system.

804.4 Finish material pollutant control. Finish materials shall comply with Sections 804.4.1 through 804.4.4.

804.4.1 Adhesives and sealants. Adhesives and sealants used on the project shall meet the requirements of the following standards.

1. Adhesives, adhesive bonding primers, adhesive primers, sealants and sealant primers shall comply with Table 804.4.1.
2. Aerosol adhesives shall meet the requirements of California Code of Regulations, Title 17, commencing with Section 94507, <http://ccr.oal.ca.gov/>.

804.4.2 Paints and coatings. Architectural paints and coatings shall comply with Table 804.4.2.

**TABLE 804.4.1
ADHESIVE VOC LIMIT**

Less Water and Less Exempt Compounds in Grams per Liter

<u>Architectural Applications</u>	<u>Current VOC Limit</u>
<u>Indoor Carpet Adhesives</u>	<u>50</u>
<u>Carpet Pad Adhesives</u>	<u>50</u>
<u>Outdoor Carpet Adhesives</u>	<u>150</u>
<u>Wood Flooring Adhesive</u>	<u>100</u>
<u>Rubber Floor Adhesives</u>	<u>60</u>
<u>Subfloor Adhesives</u>	<u>50</u>
<u>Ceramic Tile Adhesives</u>	<u>65</u>
<u>VCT and Asphalt Tile Adhesives</u>	<u>50</u>
<u>Dry Wall and Panel Adhesives</u>	<u>50</u>
<u>Cove Base Adhesives</u>	<u>50</u>
<u>Multipurpose Construction Adhesives</u>	<u>70</u>
<u>Structural Glazing Adhesives</u>	<u>100</u>
<u>Single Ply Roof Membrane Adhesives</u>	<u>250</u>

**TABLE 804.4.2
COATING VOC LIMITS**

Grams of VOC Per Liter of Coating, Less Water and Less Exempt Compounds

<u>COATING CATEGORY</u>	<u>CEILING LIMIT*</u>	<u>CURRENT LIMIT</u>	<u>EFFECTIVE DATE 7/1/08</u>	<u>EFFECTIVE DATE</u>
Bond Breakers	350			
Clear Wood Finishes	350	275		
Varnish	350	275		
Sanding Sealers	350	275		
Lacquer	680	275		
Clear Brushing Lacquer	680	275		
Concrete-Curing Compounds	350	100		
Dry-Fog Coatings	400	150		
Fire-Proofing Exterior Coatings	450	350		
Flats	250	100	50	
Floor Coatings	420	50		
Graphic Arts (Sign) Coatings	500			
Industrial Maintenance (IM) Coatings	420	100		
High Temperature IM Coatings		420		
Zinc-Rich IM Primers	420	100		
Japans/Faux Finishing Coatings	700	350		
Magnesite Cement Coatings	600	450		
Mastic Coatings	300			
Metallic Pigmented Coatings	500			
Multi-Color Coatings	420	250		
Nonflat Coatings	250	50		
Nonflat High Gloss	250	50		
Pigmented Lacquer	680	275		
Pre-Treatment Wash Primers	780	420		
Primers, Sealers and Undercoaters	350	100		
Quick-Dry Enamels	400	50		
Quick-Dry Primers, Sealers, and Undercoaters	350	100		
Recycled Coatings	250			
Roof Coatings	300	50		
Roof Coatings, Aluminum	500	100		
Roof Primers, Bituminous	350			
Rust Preventative Coatings	420	100		
Shellac				
Clear	730			
Pigmented		550		
Specialty Primers	350	100		
Stains	350	100		
Interior	250			
Swimming Pool Coatings				
Repair	650	340		
Other	340			
Waterproofing Sealers	400	100		
Waterproofing Concrete/Masonry Sealers	400	100		
Wood Preservatives				
Below-Ground	350			
Other		350		

* The specified limits remain in effect unless revised limits are listed in subsequent columns in the Table.

Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturers product specification.
2. Field verification of on-site product containers.

804.4.3 Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of one of the following:

1. Carpet and Rug Institute's Green Label or Green Label Plus Program, <http://www.carpet-rug.com/>
2. CDPH Standard Practice for the testing of VOCs (Specification 01350)
3. Department of General Services, California Gold Sustainable Carpet Standard, <http://www.green.ca.gov/EPP/standards.htm>
4. Scientific Certifications Systems Indoor Advantage™ Gold, <http://www.scs-certified.com/iaq/indooradvantage.htm>

804.4.3.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.

804.4.3.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Section 804.1.1: VOC limit of 50 grams per liter (less water and less exempt compounds).

804.4.4 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in Table 804.4.

804.4.4.2 Agrifiber products. Agrifiber products shall contain no added urea-formaldehyde resins.

804.4.4.3 Adhesives. Adhesives used to fabricate composite wood and agrifiber assemblies shall contain no urea-formaldehyde resins.

804.4.4.4 Documentation. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation shall include at least one of the following.

1. Mill certifications and specifications.
2. Chain of custody certifications.
3. Other methods acceptable to the enforcing agency.

**TABLE 804.4.4
FORMALDEHYDE LIMITS**

Maximum formaldehyde emissions in parts per million.

Product	Phase 1		Phase 2			
	Jan 1, 2009	Jul 1, 2009	Jan 1, 2010	Jan 1, 2011	Jan 1, 2012	Jul 1, 2012
Hardwood Plywood Veneer Core	0.08		0.05			
Hardwood Plywood Composite Core		0.08				0.05
Particle Board	0.18			0.09		
Medium Density Fiberboard	0.21			0.11		
Thin Medium Density Fiberboard ¹	0.21				0.13	

¹Thin medium density fiberboard has a maximum thickness of eight millimeters.

SECTION 805 INDOOR MOISTURE CONTROL

805.1 Indoor moisture control. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Section 1203 and Chapter 14. For additional measures not applicable to low-rise residential occupancies, see Section 707.2.

805.2 Concrete slab foundations. Concrete slab foundations required to have a vapor retarder by California Building Code, CCR, Title 24, Part 2, Chapter 19 shall also comply with this section.

805.2.1 Capillary break. A capillary break shall be installed in compliance with at least one of the following.

1. A 4 inch (101.6 mm) thick base of ½ inch (12.7 mm) or larger clean aggregate shall be provided with a vapor barrier in direct contact with concrete and a concrete mix design which will address bleeding, shrinkage, and curling shall be used. For additional information, see ACI 302.2R-06.
2. Other equivalent methods approved by the enforcing agency.
3. A slab design specified by a licensed design professional.

805.3 Moisture content of building materials. Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19% moisture content. Moisture content shall be verified in compliance with the following:

1. Moisture content shall be determined with either a probe-type or a contact-type moisture meter.
2. Moisture readings shall be taken at a point 2 feet (610 mm) to 4 feet (1219 mm) from the gradestamped end of each piece to be verified.
3. At least three random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing.

Insulation products which are visibly wet or have a high moisture content shall be replaced or allowed to dry prior to enclosure in wall or floor cavities. Wet applied insulation products shall follow the manufacturers drying recommendations prior to enclosure.

SECTION 806 **INDOOR AIR QUALITY AND EXHAUST**

806.3 Bathroom exhaust fans. Except when a whole house ventilation system is used, a mechanical exhaust fan shall be provided in each room containing a bathtub, shower, or tub/shower combination. Mechanical exhaust fans shall comply with the following.

1. Exhaust system shall comply with ASHRAE 62.2, Section 5.
2. Exhaust fans shall be ENERGY STAR compliant and terminate outside the building.

Exception: Multiple bathrooms using a common multiple port fan.

806.4 Filters. Heating and air conditioning filters shall be rated at MERV 6 or higher. Duct system design shall account for pressure drop across the filter.

SECTION 807 **ENVIRONMENTAL COMFORT** **(Reserved)**

SECTION 808 **OUTDOOR AIR QUALITY** **(Reserved)**

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 9

REFERENCED STANDARDS

SECTION 901 GENERAL

901.1 This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard.

AAMA American Architectural Manufacturers Association
1827 Walden Office Square
Suite 550
Schaumburg, IL 60173-4268
www.aamanet.org
ANSI American National Standards Institute
Operations Office
25 West 43rd Street
Fourth Floor
New York, NY 10036
www.ansi.org
ARI Air Conditioning and Refrigeration Institute
4100 North Fairfax Drive
Suite 200
Arlington, VA 22203
www.ari.org
ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
1791 Tullie Circle, NE
Atlanta, GA 30329
www.ashrae.org
ASME American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990
www.asme.org
ASTM ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2859
www.astm.org
CSA Canadian Standards Association
5060 Spectrum Way, Suite 100
Mississauga, Ontario, Canada L4W 5N6
www.csa.ca
CTI Cooling Technology Institute
2611 FM 1960 West, Suite A-101
Houston, TX 77068-3730
www.cti.org
DOE U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585
www.energy.gov
HI Hydronics Institute, Division of the Gas Appliance Manufacturers Association
P.O. Box 218
Berkeley Heights, NJ 07054
www.gamanet.org

IAPMO International Association of Plumbing and Mechanical Officials
5001 E. Philadelphia St.
Ontario, CA 91761
iapmo@iapmo.org
ICC International Code Council, Inc.
National Headquarters
500 New Jersey Avenue NW
6 th Floor
Washington, D.C. 20001-2070
www.iccsafe.org
California Office
Los Angeles District Office
5360 Workman Mill Road
Whittier, CA 90601
www.iccsafe.org
NFPA National Fire Protection Association
1 Batterymarch Park
Quincy, Massachusetts
USA 02169-7471
www.nfpa.org
NFRC National Fenestration Rating Council, Inc.
6305 Ivy Lane, Suite 140
Greenbelt, MD 20770
www.nfrc.org
SMACNA Sheet Metal and Air Conditioning Contractors National Association, Inc.
4021 Lafayette Center Drive
Chantilly, VA 20151-1209
www.smacna.org
UL Underwriters Laboratories Inc.
Headquarters
333 Pfingsten Road
Northbrook, IL 60062-2096
www.ul.com
WDMA Window and Door Manufacturers Association
1400 East Touhy Avenue, Suite 470
Des Plaines, IL 60018
www.wdma.com

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 10

INSTALLER AND THIRD PARTY QUALIFICATIONS

SECTION 1001

GENERAL

(Reserved)

SECTION 1002 **QUALIFICATIONS**

(Reserved)

**SECTION 1003
VERIFICATIONS
(Reserved)**

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

CHAPTER 11

APPLICATION CHECKLISTS AND WORKSHEETS

APPLICATION CHECKLIST (AC-HCD)

GREEN BUILDING MEASURE	REQUIRED	OPTIONAL	REQUIRED 3RD PARTY VERIFICATION
PLANNING AND DESIGN			
Site Development (406)			
406.2 A plan is developed and implemented to manage storm water drainage during construction.	2010 CBC ¹		
ENERGY EFFICIENCY			
Performance Approach. (503)			
503.2 Minimum requirements. Low-rise residential buildings shall meet or exceed the minimum standard design required by the California Energy Standards currently in effect.	2010 CBC ¹		
AIR SEALING PACKAGE (506)			
506.1 Joints and openings. Joints and other openings at the following locations: 1. Exterior joints around window and door frames, including doors between the house and garage, between interior HVAC closets and unconditioned space, between attic and underfloor access and conditioned space and between wall sole plates, floors, exterior panels and all siding materials. 2. Openings for plumbing, electrical and gas lines in exterior walls and interior wall, ceilings and floors. 3. Openings into the attic. 4. Exhaust ducts from clothes dryers and other exhaust fans shall have a damper. 5. Cuts or notches in exterior wall plates.	2010 CBC ¹		

<u>506.1.1 Other openings.</u> Whole house fan louvers shall close tightly and be insulated or covered to a minimum of R-4.2.			
<u>WATER EFFICIENCY AND CONSERVATION</u>			
<u>Indoor Water Use (603)</u>			
<u>603.2</u> Indoor water use shall be reduced by 20% using one of the follow methods. 1. Water saving fixtures or flow restrictors shall be used. 2. A 20% reduction in baseline water use shall be demonstrated.	7/01/2011		
<u>MATERIAL CONSERVATION AND RESOURCE EFFICIENCY</u>			
<u>Pollutant Control during Construction (705)</u>			
<u>705.3</u> HVAC returns, supplies, and other air handling equipment are covered during construction.	2010 CBC ¹		
<u>Construction Waste Reduction, Disposal and Recycling (709)</u>			
<u>709.2</u> A construction waste management plan is developed, implemented and posted at the jobsite for recycling or salvaging waste in compliance with one of the following methods. 1. A minimum of 50% of the construction waste generated at the site is diverted to recycle or salvage. Exception: Alternate waste reduction methods are developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.	2010 CBC ¹		
<u>Building Maintenance and Operation (711)</u>			
<u>711.2</u> An operation and maintenance manual shall be provided to the building occupant or owner.	2010 CBC ¹		

INDOOR ENVIRONMENTAL QUALITY			
Pollutant Control (804)			
804.1.1 Sealants and adhesives shall be No- or Low-VOC.	<u>2010 CBC¹</u>		
804.1.2 Paints, stains and other coatings shall be No- or Low-VOC.	<u>2010 CBC¹</u>		
804.1.3 Carpet and carpet systems shall be Low-VOC.	<u>2010 CBC¹</u>		
804.1.4.1 Particleboard, medium density fiberboard (MDF), and plywood used in interior finish systems shall comply with low formaldehyde emission standards.	<u>2010 CBC¹</u>		
804.1.4.2 Plywood used in interior finish systems shall comply with low formaldehyde emission standards.	<u>2010 CBC¹</u>		
804.3 Duct openings and other related air distribution component openings shall be covered.	<u>2010 CBC¹</u>		
Interior Moisture Control (805)			
805.2.1 Vapor retarder and capillary break is installed at slab on grade foundations.	<u>2010 CBC¹</u>		
805.3 Moisture content of wood used in wall and floor framing is checked before enclosure.	<u>2010 CBC¹</u>		
Air Quality and Exhaust (806)			
806.3 Exhaust fans which terminate outside the building are provided in every bathroom.	<u>2010 CBC¹</u>		
806.4 MERV 6, or higher filters are installed on central air and heating systems.	<u>2010 CBC¹</u>		

¹Unless specified otherwise, this measure shall become effective on the effective date of the 2010 California Building Code.

WORKSHEET (WS-1)
BASELINE WATER USE

BASELINE WATER USE CALCULATION TABLE										
<u>Fixture Type</u>	<u>Quantity</u>		<u>Flow-rate (gpm)</u>		<u>Duration</u>		<u>Daily uses</u>		<u>Occupants</u> ^{3,4}	<u>Gallons per day</u>
<u>Showerheads</u>		X	<u>2.5</u>	X	<u>5 min.</u>	X	<u>1</u>	X		≡
<u>Showerheads Residential</u>		X	<u>2.5</u>	X	<u>8 min.</u>	X	<u>1</u>	X		≡
<u>Lavatory Faucets Residential</u>		X	<u>2.2</u>	X	<u>.25 min.</u>	X	<u>3</u>	X		≡
<u>Kitchen Faucets</u>		X	<u>2.2</u>	X	<u>4 min.</u>	X	<u>1</u>	X		≡
<u>Replacement Aerators</u>		X	<u>2.2</u>	X		X		X		≡
<u>Wash Fountains</u>		X	<u>2.2</u>	X		X		X		≡
<u>Metering Faucets</u>		X	<u>0.25</u>	X	<u>.25 min.</u>	X	<u>3</u>	X		≡
<u>Metering Faucets for Wash Fountains</u>		X	<u>2.2</u>	X	<u>.25 min.</u>	X		X		≡
<u>Gravity tank type Water Closets</u>		X	<u>1.6</u>	X	<u>1 flush</u>	X	<u>1 male¹ 3 female</u>	X		≡
<u>Flushometer Tank Water Closets</u>		X	<u>1.6</u>	X	<u>1 flush</u>	X	<u>1 male¹ 3 female</u>	X		≡
<u>Flushometer Valve Water Closets</u>		X	<u>1.6</u>	X	<u>1 flush</u>	X	<u>1 male¹ 3 female</u>	X		≡
<u>Electromechanical Hydraulic Water Closets</u>		X	<u>1.6</u>	X	<u>1 flush</u>	X	<u>1 male¹ 3 female</u>	X		≡
<u>Blowout Water Closets</u>		X	<u>3.5</u>	X	<u>1 flush</u>	X	<u>1 male¹ 3 female</u>	X		≡
<u>Urinals</u>		X	<u>1.0</u>	X	<u>1 flush</u>	X	<u>2 male</u>	X		
<u>Total daily baseline water use (BWU)</u>										≡
<u>(BWU) X .80 = Allowable water use</u>										

¹ Except for low-rise residential occupancies the daily use number shall be increased to three if urinals are not installed in the room.
² The Flow-rate is from the CEC Appliance Efficiency Standards, Title 20 California Code of Regulations; where a conflict occurs, the CEC standards shall apply.
³ For low-rise residential occupancies, the number of occupants shall be based on two persons for the first bedroom, plus one additional person for each additional bedroom.
⁴ For non-residential occupancies, refer to Table A, Chapter 4, 2007 California Plumbing Code, for occupant load factors.

WORKSHEET (WS-2)
20% REDUCTION WATER USE CALCULATION TABLE

20% REDUCTION WATER USE CALCULATION TABLE										
Fixture Type	Quantity	Flow-rate (gpm)	Duration	Daily uses	Occupants ^{3,4}	Gallons per day				
Showerheads	X	X	5 min.	X	1	≡				
Showerheads Residential	X	X	8 min.	X	1	≡				
Lavatory Faucets Residential	X	X	25 min.	X	3	≡				
Kitchen Faucets	X	X	4 min.	X	1	≡				
Replacement Aerators	X	X		X		≡				
Wash Fountains	X	X		X		≡				
Metering Faucets	X	X	.25 min.	X	3	≡				
Metering Faucets for Wash Fountains	X	X	.25 min.	X		≡				
Gravity tank type Water Closets	X	X	1 flush	X	1 male ¹ 3 female	≡				
HET ⁵ High Efficiency Toilet	X	1.28	1 flush	X	1 male ¹ 3 female	≡				
Flushometer Tank Water Closets	X	X	1 flush	X	1 male ¹ 3 female	≡				
Flushometer Valve Water Closets	X	X	1 flush	X	1 male ¹ 3 female	≡				
Electromechanical Hydraulic Water Closets	X	X	1 flush	X	1 male ¹ 3 female	≡				
Blowout Water Closets	X	X	1 flush	X	1 male ¹ 3 female	≡				
Urinals	X	X	1 flush	X	2 male	≡				
Urinals Non-Water Supplied	X	0.0	1 flush	X	2 male	≡				
Proposed water use						≡				
_____ (BWU from GW-1) X .80 = _____						Allowable water use				

¹ Except for low-rise residential occupancies the daily use number shall be increased to three if urinals are not installed in the room.
² The Flow-rate is from the CEC Appliance Efficiency Standards, Title 20 California Code of Regulations; where a conflict occurs, the CEC standards shall apply.
³ For low-rise residential occupancies, the number of occupants shall be based on two persons for the first bedroom, plus one additional person for each additional bedroom.
⁴ For non-residential occupancies, refer to Table A, Chapter 4, 2007 California Plumbing Code, for occupant load factors.
⁵ Water closet with an effective flush rate of 1.28 gallons or less when tested per ASME A112.19.2 and ASME A112.19.14.

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.

APPENDIX A

COMMENTARY OF ADDITIONAL DESIGN CONSIDERATIONS

SECTION A101 **GENERAL**

A101.1 Scope. The measures contained in this appendix are not mandatory and provide commentary for additional measures which designers, builders, and property owners may wish to consider during the planning, design and construction process.

SECTION A201 **DEFINITIONS**

A201.1 Scope. Unless otherwise stated, the words and terms used in this appendix shall, for the purposes of this chapter, have the meanings shown in this code.

SECTION A301 **GREEN BUILDING**

A301.1 Scope. Buildings shall be designed to include the green building measures specified as mandatory in the application worksheets contained in Chapter 11 of this code. Optional green building measures may be included but are not required. Additional considerations which designers, builders, and property owners may wish to consider during the planning, design and construction process are contained in this appendix.

SECTION A401 **PLANNING AND DESIGN**

A401.1 General. (Reserved)

A402.1 Definitions. (Reserved)

A403.1 Site Selection. (Reserved)

A404.1 Site Preservation. (Reserved)

A405.1 Deconstruction and Reuse of Existing Structures.

A405.1.1 If feasible, disassemble existing buildings instead of demolishing to allow for reuse or recycling of building materials.

A406.1 Site Development.

A406.1.1 Orient buildings to optimize the use of solar energy with the long side of the house oriented within 30° of south.

A406.1.2 Post construction landscapes designs accomplish as many of the following as possible:

- 1.** Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.
- 2.** Limit turf areas to the extent possible.
- 3.** Utilize plant and tree species appropriate for the climate zone region.

SECTION A501 **ENERGY EFFICIENCY**

A501.1 General. (Reserved)

A502.1 Definitions. (Reserved)

A503.1 Performance Approach.

A503.1.1 Incorporate the California Energy Commission, New Solar Homes Partnership (NSHP) ^{1,2} specifications for building energy performance requirements.

Using an Alternative Calculation Method (ACM) approved by the California Energy Commission, calculate each building's energy and CO₂ emissions, and compare it to the standard or "budget" building to achieve the following:

Tier I. Exceed 2007 California Energy Code requirements by 15%.

Tier II. Exceed 2007 California Energy Code requirements by 35% and cooling energy requirements by 40%.

Solar water heating may be used to assist in meeting the energy efficiency requirements of either Tier I or Tier II.

Document and field verify the measures and calculations used to reach the desired level of efficiency following the requirements specified in the Title 24 Residential Alternative Calculation Manual.

¹ In addition, for either Tier I or II, each appliance provided by the builder must be Energy Star if an Energy Star designation is applicable for that appliance. Solar water heating may be used to assist in meeting the energy efficiency requirements of either Tier I or Tier II.

² Information on NSHP incentives available through the California Energy Commission may be obtained at the "Go Solar California" website: www.GoSolarCalifornia.ca.gov/nsdp/index.html.

A504.1 Prescriptive Approach. (Reserved)

A505.1 Building Envelope. (Reserved)

A506.1 Air Sealing Package. (Reserved)

A507.1 HVAC Design, Equipment and Installation. (Reserved)

A507.1.1 Duct systems are sized, designed, and equipment is selected using the following methods:

1. Size duct systems according to ACCA 29-D (Manual D) or equivalent.
2. Select heating and cooling equipment according to ACCA 36-S (Manual S) or equivalent.
3. Establish heat loss and heat gain values according to ACCA Manual J or equivalent.

A507.1.2 Radiant, hydronic and other innovative space heating and cooling systems included in the proposed design shall be designed using generally accepted industry-approved guidelines and design criteria.

A507.1.3 The following items pertaining to the heating and cooling systems are inspected and certified by an independent third party agency:

1. Verify compliance with the manufacturers recommended start-up procedures.
2. Verify refrigerant charge by super-heat or other methods specified by the manufacturer.
3. Burner is set to fire at the nameplate input rating.
4. Temperature drop across the evaporator is within the manufacturers recommended range.
5. Test and verify air flow to be within 10% of the initial design air flow.
6. Static pressure within the duct system is within the manufacturers acceptable range.

A507.1.4 The HVAC contractor and installer are certified for equipment and duct installation by a nationally or regionally recognized training or certification program.

A507.1.5 When possible, use gas-fired (natural or propane) space heating equipment with an Annual Fuel Utilization Ratio (AFUE) of .92 or higher.

A507.1.6 If an electric heat pump must be used, select equipment with a Heating Seasonal Performance Factor (HSPF) of 8.0 or higher.

A507.1.7 When climatic conditions necessitate the installation of cooling equipment, select cooling equipment with a Seasonal Energy Efficiency Ratio (SEER) higher than 13.0.

A507.1.8 If possible, install ductwork to comply with as many of the following as possible:

1. Install ducts within the conditioned envelope of the building.
2. Install ducts in an underfloor crawl space.
3. Use ducts with an R-6 insulation value or higher.

A507.1.9 Perform duct leakage testing to verify a total leakage rate of less than 6% of the total fan flow.

A507.1.10 In cooling zones, install a whole-house fan with insulated louvers or an insulated cover.

A508.1 Water Heating Design, Equipment and Installation.

A508.1.1 The Energy Factor (EF) for a gas fired storage water heater is .62 or higher.

A508.1.2 The Energy Factor (EF) for a gas fired tankless water heater is .80 or higher.

A508.1.3 Insulate all hot water lines with a minimum of R-6 insulation.

A509.1 Lighting (reserved).

A510.1 Appliances.

A510.1.1 Each appliance provided by the builder meets Energy Star if an Energy Star designation is applicable for that appliance.

A511.1 Renewable Energy.

A511.1.1 Install a solar photovoltaic (PV) system in compliance with the California Energy Commission New Solar Homes Partnership (NSHP).^{1, 2} Install energy efficiency measures meeting either Tier I or Tier II below.

Tier I. Exceed 2007 California Energy Code requirements by 15%.

Tier II. Exceed 2007 California Energy Code requirements by 35% and cooling energy requirements by 40%.

¹ In addition, for either Tier I or II, each appliance provided by the builder must be Energy Star if an Energy Star designation is applicable for that appliance. Solar water heating may be used to assist in meeting the energy efficiency requirements of either Tier I or Tier II.

² Information on NSHP incentives available through the California Energy Commission may be obtained at the "Go Solar California" website: www.GoSolarCalifornia.ca.gov/nsdp/index.html.

A512.1 Elevators, Escalators and Other Equipment. (Reserved)

SECTION A601 **WATER EFFICIENCY AND CONSERVATION**

A601.1 General. (Reserved)

A602.1 Definitions. (Reserved)

A603.1 Indoor Water Use.

A603.1.1 Hot water distribution systems should utilize at least one of the following methods or features in the distribution system:

1. An on-demand hot water recirculation system.
2. A point of use hot water system.
3. A centrally located hot water heater to minimize the length of piping between the fixtures and water heater.
4. Hot water piping is sized to meet the minimum pipe size diameters allowed by the California Plumbing Code.
5. A hot water distribution system is designed to keep all hot water piping runs as short as possible.

A604.1 Outdoor Water Use.

A604.1.1 Install a low-water consumption irrigation system which does not rely on spray type heads.

A604.1.2 Use a zoned Irrigation system.

A604.1.3 Use weather-based irrigation controllers to automatically by-pass the irrigation schedule if rain is forecast.

A605.1 Recycled, Reclaimed and Graywater Systems.

A605.1.1 If feasible, utilize a graywater underground irrigation system in compliance with Chapter 16 of the California Plumbing Code.

SECTION A701
MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

A701.1 General. (Reserved)

A702.1 Definitions. (Reserved)

A703.1 Foundation Systems.

A703.1.1 As allowed by local conditions, utilize a Frost-Protected Shallow Foundation (FPSF) in compliance with the International Residential Code.

A704.1 Efficient Framing Techniques.

A704.1.1 When possible, minimize the cutting of framing material and eliminate waste by designing building dimensions in 2 foot increments and by placing windows and doors at stud positions established by a running layout.

A704.1.2 Use pre-manufactured floor and roof systems to eliminate solid sawn lumber whenever possible.

A705.1 Material Sources.

A705.1.1 Utilize pre-finished building materials which do not require additional painting or staining when possible.

A705.1.2 Use sealed concrete floors instead of other floor coverings when possible.

A705.1.3 Use recycled or salvaged building materials if possible.

A705.1.4 Utilize building materials manufactured from renewable resources when possible.

A705.1.5 Utilize wood products harvested from certified forests when available.

A705.1.6 Incorporate sufficient space for recycling containers into the design of the building.

A706.1 Enhanced Durability and Reduced Maintenance. (Reserved)

A707.1 Water Resistance and Moisture Management.

A707.1.1 Install foundation and landscape drains.

A707.1.2 Install gutter and downspout systems to route water away from the foundation or connect to landscape drains.

A707.1.3 Provide flashing details on the building plans and comply with accepted industry standards or manufacturers instructions.

A707.1.4 Protect building materials delivered to the construction site from rain and other sources of moisture.

A708.1 Construction Waste Reduction, Disposal and Recycling. (Reserved)

A709.1 Life-cycle Assessment. (Reserved)

A710.1 Building Maintenance and Operation. (Reserved)

SECTION A801
ENVIRONMENTAL QUALITY

A801.1 General. (Reserved)

A802.1 Definitions. (Reserved)

A803.1 Fireplaces.

A803.1.1 If possible, use direct-vent heating and cooling equipment if the equipment will be located in the conditioned space.

A804.1 Pollutant Control. (Reserved)

A805.1 Interior Moisture Control. (Reserved)

A806.1 Indoor Air Quality and Exhaust.

A806.1.1 Install a fan controlled by a humidistat in each room containing a shower or bathtub, or use a whole house humidity control system.

A807.1 Environmental Comfort. (Reserved)

A808.1 Outdoor Air Quality. (Reserved)

Authority Cited—Health and Safety Code Sections 17921, 17922 and 19990.

Reference—Health and Safety Code Sections 17000 through 17060, 17910 through 17990 and 19960 through 19997.